(19) World Intellectual Property Organization International Bureau





(43) International Publication Date 23 June 2005 (23.06.2005)

PCT

(10) International Publication Number WO 2005/056780 A2

- (51) International Patent Classification⁷: C12N 5/08, 5/06
- (21) International Application Number:

PCT/GB2004/004826

(22) International Filing Date:

24 November 2004 (24.11.2004)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: 0328245.6

5 December 2003 (05.12.2003) GB

- (71) Applicant (for all designated States except US): THE UNIVERSITY OF BIRMINGHAM [GB/GB]; Edgbaston, Birmingham B15 2TT (GB).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): BUNCE, Christopher, Martin [GB/GB]; Shool of Biosciences, The University of Birmingham, Edgbaston, Birmingham B15 2TT (GB).
- (74) Agents: WARD, David, I. et al.; Marks & Clerk, Alpha Tower, Suffolk Street Queensway, Birmingham B1 1TT (GB).

- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

 without international search report and to be republished upon receipt of that report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: BIOLOGICAL CELL CULTURE, CELL CULTURE MEDIA AND THERAPEUTIC USE OF BIOLOGICAL CELLS

(57) Abstract: The protein NM23 is disclosed as an agent for the maintenance of undifferentiated biological cells in culture. The NM23 protein may act as a survival factor for such cultured cells, or to prevent the differentiation and maturation of the cultured cells. The use of NM23 protein is applicable to culture of stem and/or progenitor cells, and particularly to such cells cultured and adapted for therapeutic use. The invention provides methods, media and media supplements for use in the culture of biological cells, and further provides methods of preparing biological cells for therapeutic use, as well as methods of therapy utilising biological cells and medicaments comprising biological cells adapted for therapeutic use.



(19) World Intellectual Property Organization International Bureau





(43) International Publication Date 23 June 2005 (23.06.2005)

PCT

(10) International Publication Number WO 2005/056780 A3

- (51) International Patent Classification7: C12N 5/08, 5/06
- (21) International Application Number:

PCT/GB2004/004826

(22) International Filing Date:

24 November 2004 (24.11.2004)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data: 0328245.6

5 December 2003 (05.12.2003)

- (71) Applicant (for all designated States except US): THE UNIVERSITY OF BIRMINGHAM [GB/GB]; Edgbaston, Birmingham B15 2TT (GB).
- (72) Inventor; and
- (75) Inventor/Applicant (for US only): BUNCE, Christopher, Martin [GB/GB]; Shool of Biosciences, The University of Birmingham, Edgbaston, Birmingham B15 2TT (GB).
- (74) Agents: WARD, David, I. et al.; Marks & Clerk, Alpha Tower, Suffolk Street Queensway, Birmingham B1 1TT (GB).
- (81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- (88) Date of publication of the international search report: 28 July 2005

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: CELL CULTURE WITH NM23, CELL CULTURE MEDIA COMPRISING NM23 AND THERAPEUTIC USE OF CELLS CULTURED IN THE PRESENCE OF NM23.

(57) Abstract: The protein NM23 is disclosed as an agent for the maintenance of undifferentiated biological cells in culture. The NM23 protein may act as a survival factor for such cultured cells, or to prevent the differentiation and maturation of the cultured cells. The use of NM23 protein is applicable to culture of stem and/or progenitor cells, and particularly to such cells cultured and adapted for therapeutic use. The invention provides methods, media and media supplements for use in the culture of biological cells, and further provides methods of preparing biological cells for therapeutic use, as well as methods of therapy utilising biological cells and medicaments comprising biological cells adapted for therapeutic use.

